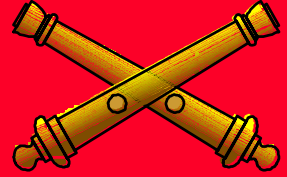


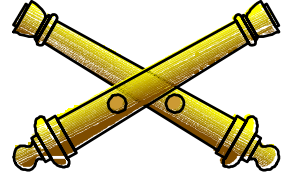
GUNNERY DEPARTMENT



THE KING OF BATTLE

**U
S
A
F
A
S**

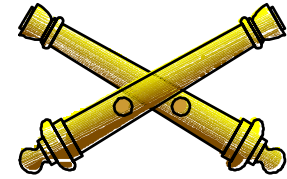
GUNNERY DEPARTMENT



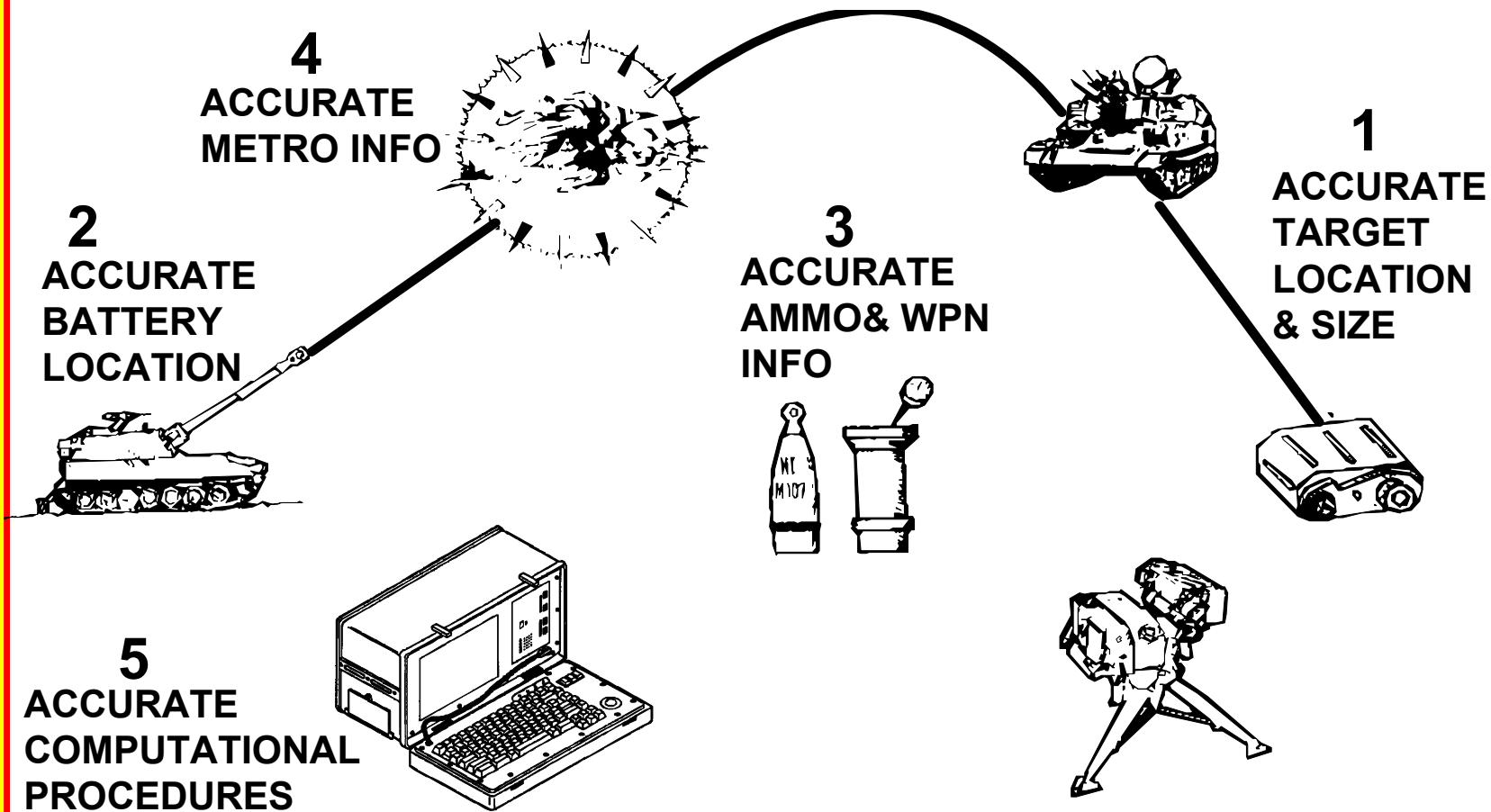
BCS TROUBLE SHOOTING

**U
S
A
F
S**

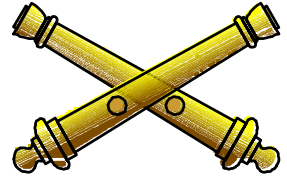
GUNNERY DEPARTMENT



FIVE REQUIREMENTS FOR ACCURATE PREDICTED FIRE



U
S
A
F
S

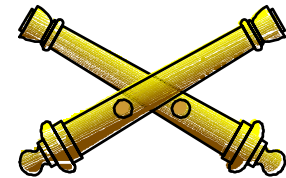


TROUBLE SHOOTING

- **ISOLATE PROBLEMS**
- **USE A SYSTEMATIC APPROACH TO CORRECT THE FAULT**

GUNNERY DEPARTMENT

CORRECTING THE FAULT

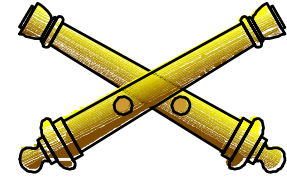


ASK THE FOLLOWING QUESTIONS:

- **IS IT AFFECTING MY ENTIRE BATTERY?**
- **IS IT AFFECTING JUST ONE GUN?**
- **IS IT A RANGE ERROR?**
- **IS IT A LATERAL ERROR?**
- **IS IT A RANGE AND LATERAL ERROR?**
- **DID THE SOLUTION SOLVE THE ENTIRE PROBLEM?**

**U
S
A
F
A
S**

GUNNERY DEPARTMENT



SITE ERROR

BCS (CHG 4 GB RG 5000) ACTUAL

TGT 400
- PLT 368
VI = +32
SITE = +7

TGT 350
- PLT 368
VI = - 18
SITE = - 4

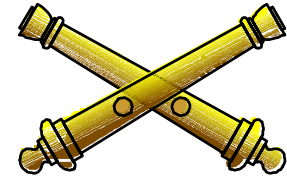
GO TO COL 5 TBL F, TFT - CHANGE IN RANGE FOR A
CHANGE IN 1 MIL OF ELEVATION

(TBL F TFT)
BCS +7mils X 13M = +91M
- ACTUAL -4 mils X 13M = - (- 52M)
= ERROR +143M

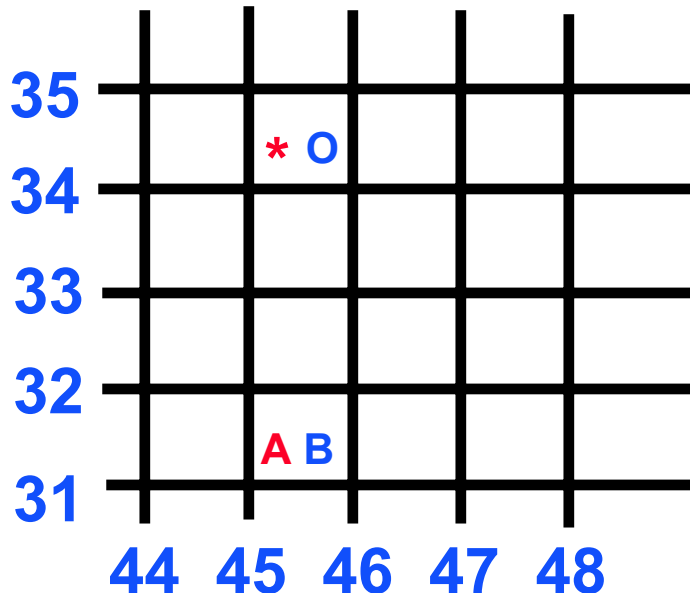
(EXPRESS TO NEAREST 10 M) OVER 140 M

U
S
A
F
S

GUNNERY DEPARTMENT



ORSTA ERROR



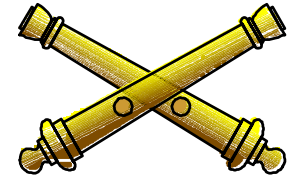
B = BCS ORSTA

A = ACTUAL ORSTA

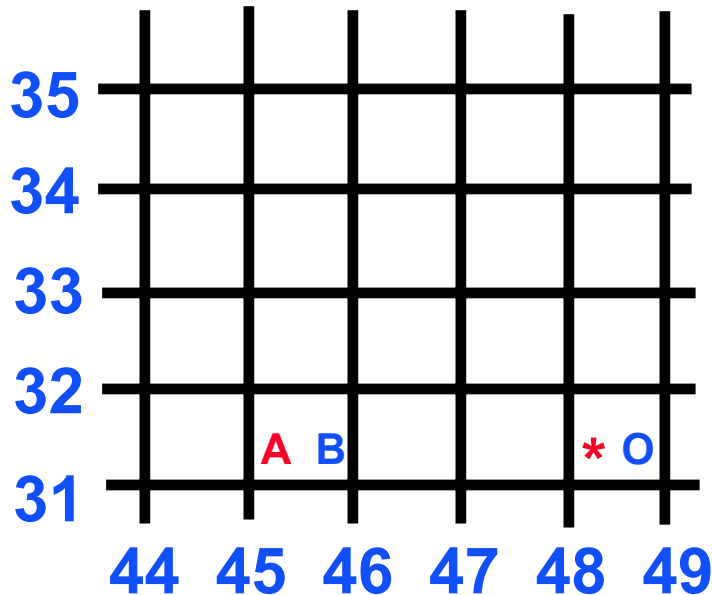
DIR OF FIRE 6400

BCS	45810	31442	400
- ACTUAL	45310	31442	400
=ERROR	500 M	WEST	

**U
S
A
F
S**



ORSTA ERROR



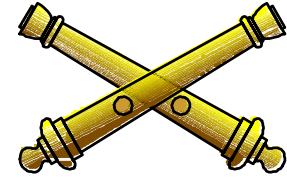
B = BCS ORSTA

A = ACTUAL ORSTA

DIR OF FIRE 1600

BCS	45810 31442 400
- ACTUAL	45310 31442 400
=ERROR	500 M WEST

GUNNERY DEPARTMENT



AZIMUTH OF LAY ERROR

CHG 5WB RG 5700M




ACTUAL AOL	1650
- BCS AOL	1600
<u>=ERROR (RALS)</u>	<u>R50 mils</u>
<u>x RG (1000'S)</u>	<u>5.7</u>


R285M / 1.0186 = R279.8

(EXPRESS TO NEAREST 10 M) RIGHT 280M

U
S
A
F
S

USAFS

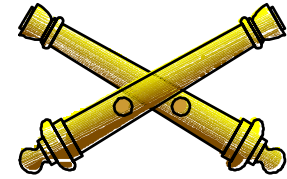
BCS HE PROJECTILE WT 93.9 LBS = 3 

ACTUAL HE PROJECTILE WT 6 

(*TBL F TFT*)

BCS	D 1 □ X	+24M	= +24M
- ACTUAL I	2 □ X	- 22M	= - 44M
<hr/>			
=ERROR			+68M

(EXPRESS TO NEAREST 10 M) **OVER 70M**



PROPELLANT TEMPERATURE ERROR

FIRING CHG 6WB AT RANGE 9000M

BCS PROP TEMP = 84 --> +1.1M/S (TBL E TFT)

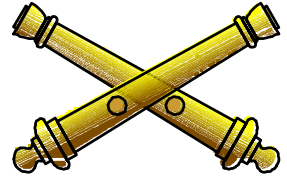
ACTUAL PROP TEMP = 48 --> - 1.8M/S (TBL E TFT)

GO TO COL 10 & 11 TBL F TFT FOR RANGE CORR FOR
+/-1M/S CHANGE IN MUZZLE VELOCITY
(TBL F TFT)

$$\begin{array}{rclcl}
 \text{BCS} & 11.1\text{M/S} & \times & - 20.4\text{M} & = & - 22.4\text{M} \\
 - \text{ACTUAL} & 1.8\text{M/S} & \times & + 20.6\text{M} & = & + 37.1\text{M} \\
 \hline
 = \text{ERROR} & & & & & - 59.5\text{M}
 \end{array}$$

(EXPRESS TO NEAREST 10 M) **SHORT 60M**

MUZZLE VELOCITY VARIATION ERROR



BCS (HE/M107) MV = 395.5 M/S

ACTUAL (HE/M107) MVV = -15.5 M/S

(STD MV FROM TFT)

BCS MVV = 395.5 M/S - 397.0 M/S = -1.5 M/S

**GO TO COL 10 & 11 TBL F TFT FOR RANGE CORR FOR
+/-1M/S CHANGE IN MUZZLE VELOCITY**

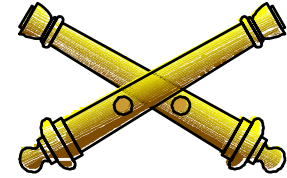
(TBL F TFT)

BCS => D1.5 M/S X +16.2M = +24.3 M
 - ACTUAL => D15.5 M/S X +16.2M = +251.1 M
 =ERROR - 226.8 M

(EXPRESS TO NEAREST 10 M) **SHORT 230M**

USAFS

GUNNERY DEPARTMENT



DEFLECTION FIRED ERROR

BCS DF CD 3200
3340
ACTUAL (FIRED) DF 3430

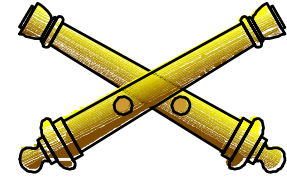
ACTUAL (FIRED) DF 3430
- BCS (COMPUTED) DF 3340
=ERROR (LARS) L90 mils
X RG (1000'S) 10.8

CHG 7WB
RANGE 10,800M

L972
 $L972 / 1.0186 = L954.2$
(EXPRESS TO NEAREST 10 M) LEFT 950M

U
S
A
F
A
S

GUNNERY DEPARTMENT



CHARGE ERROR

GUN #1 FIRED SH HE CHG 5GB DF 3187 QE 350
BCS COMPUTED SH HE CHG 4GB DF 3187 QE 350

ASSUME SI = 0, NO OTHER ERRORS EXIST

(TBL F TFT)

ACTUAL RG ACHIEVED 6700 *(INTERPOLATE TO NEAREST 10M)*
- BCS RG COMPUTED 5560

=ERROR +1140M

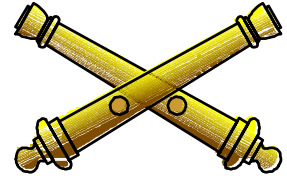
(EXPRESS TO NEAREST 10 M) **OVER 1140 M**

**U
S
A
F
S**

GUNNERY DEPARTMENT

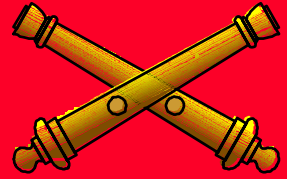
TROUBLE SHOOTING

TECHNIQUES



- 1. IS THE ERROR GUN SPECIFIC OR ENTIRE BATTERY?**
- 2. IS THE ERROR IN DEFLECTION, RANGE, OR HEIGHT OF BURST?**
- 3. ONCE THE ERROR IS ISOLATED, WAS THE ERROR OF THE CORRECT MAGNITUDE AND IN THE CORRECT DIRECTION?**
- 4. ARE THERE ANY OTHER ERRORS?**
- 5. HAS THE DATABASE BEEN VERIFIED?**
- 6. HAS THE GUNLINE BEEN VERIFIED?**

GUNNERY DEPARTMENT



THE KING OF BATTLE

**U
S
A
F
A
S**